

TKHR Docket No. 820701-1180

***AMENDMENTS TO THE CLAIMS***

A detailed listing of all claims that are, or were, in the application is presented below. Changes in the currently amended claims are shown by double brackets for deleted matter and underlining for added matter.

1. (Currently amended) A method of forming a junction or switch between at least two conductors incorporated into a fabric, comprising the steps of:

providing a fabric with at least two overlapping conductors or sections of a conductor incorporated therein wherein the conductors or sections are individually insulated conductive fibers;

removing insulation at the junction point from the conductors or sections to expose conductive fiber, wherein the step of removing the insulation includes

placing the fabric incorporating the conductors or sections between a surface and a masking device, and

removing insulation at the point of overlap of the conductors or sections identified through the masking device;

bringing the conductors into contact with each other at a junction point; and

forming a bond between the conductors at the junction point.

2. (Currently amended) The method of claim 1, [[wherein the conductors are conductive fibers]] wherein the step of removing the insulation includes dispensing a solvent through the masking device.

3. (Canceled)

4. (Original) The method of claim 1, wherein the conductors include a conductive fiber and a connector.

5. (Currently amended) The method of claim [[4]] 1, wherein the masking device is patterned with a via at the intersection of the two conductors.

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6. (Original) The method of claim 1, wherein the fabric comprises a computer-generated pattern of intersecting conductive fibers and the masking device comprises a computer-generated pattern with multiple vias that correspond to the pattern of intersecting conductive fibers in the fabric.
7. (Original) The method of claim 1, wherein the masking device comprises a material chosen from screen-printing material, plastic, and metal.
8. (Original) The method of claim 1, wherein the step of bringing the conductors into contact with each other at a junction point comprises at least one of chemical bonding, laser light application, ultrasonic welding, and combinations thereof.
9. (Original) The method of claim 1, wherein the step of bringing the conductors into contact with each other at a junction point comprises:
  - placing fabric incorporating the conductors between an anvil and a sonotrode;
  - aligning a desired junction point of the conductors at the contact point of the anvil and sonotrode; and
  - subjecting the conductors to ultrasonic vibrations while pressing the sonotrode and anvil into contact at the junction point.
10. (Original) The method of claim 1, further comprising identifying pre-selected points of junction between the two conductors.
11. (Original) The method of claim 1, wherein the fabric is already woven or knitted.
12. (Original) The method of claim 1, wherein the method is carried out during formation of the fabric.
13. (Original) The method of claim 1, wherein forming a bond between the conductors at the junction point comprises:
  - creating intense friction between the conductors, thereby exciting the conductors;

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breaking atomic bonds within each individual conductor; and  
triggering atomic binding forces between the two conductors.

14. (Original) The method of claim 1, further comprising the step of depositing a conductive paste at the junction point of the two conductors.

15. (Currently amended) [[The method of claim 14]] A method of forming a junction or switch between at least two conductors or sections of a conductor, incorporated into a fabric, comprising the steps of:

providing a fabric with at least two overlapping conductors or sections of a conductor incorporated therein;

bringing the conductors or sections into contact with each other at a junction point; and  
forming a bond between the conductors or sections at the junction point, further  
comprising the step of depositing a conductive paste at the junction point of the two conductors,

wherein the step of depositing a conductive paste at the junction point comprises:

placing the fabric incorporating the conductors or sections between a [[second]] surface and a [[second]] masking device; and

dispensing a conductive paste through the masking device.

16. (Original) The method of claim 1, wherein the method is performed off-line after fabrication of the fabric.

17. (Currently amended) A system that forms a junction between individually conductive fibers or sections of an individually conductive fiber incorporated into a fabric web, comprising:

an apparatus that brings at least two of the individually conductive fibers or two sections of an individually conductive fiber in the fabric web into contact with each other at a junction point and forms a bond between the conductive fibers or sections at the junction point,

wherein the apparatus has components disposed on opposite sides of the fabric web for bringing the conductive fibers or sections into contact with each other and forming the bond at the junction point, at least one of said components being designed for movement across the fabric web to the junction point.

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18. (Currently amended) The system of claim 17, further comprising a second apparatus that removes insulation from two intersecting individually insulated conductive fibers or sections to expose the individually conductive fibers or sections.

19. (Original) The system of claim 17, wherein the apparatus is chosen from a single textillography device and an array of textillography devices, wherein a textillography device is a device that enables the rapid realization of information routing architectures in textile structures.

20. (Currently amended) The system of claim 17, wherein [[the textillography device is disposed above and below the fabric and]] one of the components of the apparatus moves in at least one of the following directions: a two-dimensional X-Y direction along the fabric web, and a three-dimensional X-Y-Z direction along and [[above]] towards and away from the fabric web.

21. (Currently amended) [[The system of claim 17,]] A system that forms a junction between individually conductive fibers or sections of an individually conductive fiber incorporated into a fabric web, comprising:

an apparatus that brings at least two of the individually conductive fibers or two sections of an individually conductive fiber in the fabric web into contact with each other at a junction point and forms a bond between the conductive fibers or sections at the junction point,

wherein the system is situated in a fabric manufacturing assembly line, and wherein the system further comprises at least one of:

a rail upon which the [[first]] apparatus is situated, the rail being disposed [[above]] to one side of the fabric web [[and]] or a turntable to which [[each of]] the first [[and second apparatuses]] apparatus is connected.

22. (Original) The system of claim 17, wherein the apparatus is chosen from a chemical deposition device, a laser, an ultrasonic welder, and combinations thereof.

23.-24. (Canceled)

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25. (Currently amended) The method of claim [[23]] 17, wherein the conductors include a conductive fiber and a connector.

26. (Currently amended) The system of claim [[23]] 17, [[wherein the conductors are insulated, and]] further comprising at least one of:

means for removing insulation from [[two intersecting individually insulated conductors]] the fibers or sections to expose the individual conductors; and  
means for depositing a conductive paste at the junction point [[of the two conductors]].

27. (Original) The system of claim 26, wherein the conductive paste comprises a material that ensures that bonding occurs between the conductors at the junction point and increases conductivity of the fibers at the junction point.

28. (Original) The system of claim 26, wherein the means for removing the insulation comprises at least one of a chemical etching apparatus, a device for mechanical removal of the insulation, and ultrasonic welder, a laser, a heating apparatus, and combinations thereof.

29. (Currently amended) The system of claim [[23]] 17, wherein the means for bringing the [[conductors]] fibers or sections into contact with each other at [[a]] the junction point comprises at least one of a chemical, a laser, an ultrasonic welder, and combinations thereof.

30. (Currently amended) The system of claim [[23]] 17, wherein the means for forming a bond between the conductors at the junction point comprises:

means for exciting the conductors;  
means for breaking atomic bonds within each individual conductor; and  
means for triggering atomic binding forces between the two conductors.

31. (Currently amended) A method for forming a junction or switch between at least two intersecting conductors or sections of a conductor in a fabric web, comprising the steps of:

providing an apparatus for forming an electrically conductive bond between [[two]] the conductors or sections;

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providing the apparatus with means to identify the desired location for the electrically conductive bond in the fabric web;

moving the apparatus along the surface of the fabric web to the desired location for the bond;

bringing the apparatus into contact with the conductors and bringing the conductors into contact with each other at the desired location; and

forming an electrically conductive bond between the conductors at the desired location to thereby form said junction or switch.

32. (New) The method of Claim 31, wherein the conductors or sections are insulated and including the step of removing the insulation of the conductors or sections at their intersection to form the bond.

33. (New) The method of Claim 31, further including the step of applying a conductive paste to the junction or switch after forming the bond.

34. (New) The system of claim 17, wherein identifying the junction point and directing movement of the component to the junction point is automated.